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10/781,354

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Volker Dicken

7390-X04-030

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06/13/2006

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EXAMINER

HAJNIK, DANIEL F

ART UNIT

PAPER NUMBER

2628

DATE MAILED: 06/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/781,354

Applicant(s)

DICKEN, VOLKER

Examiner

Daniel F. Hajnik

Art Unit

2628

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Claims 1, 3, 6, 8, and 10 have been amended.
2. Claims 13-17 have been added.

Claim Rejections - 35 USC § 103

1. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Novak et al. (US Pub 2002/0028006 herein referred to as "Novak") in view of Wan et al. (NPL Document, "Volume Rendering Based Interactive Navigation within the Human Colon", herein referred to as "Wan").

As per claims 1, 8, and 10, Novak teaches the claimed "entering a user selected distance ... comprising a wheel mouse" by teaching of "A volume of interest may be selected by moving the positioning device such as a mouse or a joystick to navigate in the 3-D volumetric data to a particular point in the current slice" (paragraph [0040]).

Novak teaches the claimed "determining of second voxels" and the claimed "visualizing of the second voxels" by teaching of "A volume of interest may be selected by moving the positioning device such as a mouse ... Once a volume of interest has been selected the user may use several visualization tools to make a decision about whether or not the volume of interest is a nodule". (paragraph [0040]). Here, the first volumetric data is the larger overall volume and the second volumetric data is the smaller subset of volume selected from the larger volume.

Art Unit: 2628

Novak does not explicitly teach the claimed "wheel mouse". However, It would have been obvious to one of ordinary skill in the art at the time of invention to use the "wheel mouse" as claimed because it recognized in the art that a mouse often uses an internal wheel(s) to detect movement and measurement movement (or measure a distance).

Novak does not explicitly teach the claimed:

providing of volumetric data, the volumetric data having first voxels belonging to a reference surface, the reference surface being a surface of a body region

Wan teaches the claimed limitation by teaching of:

In our fast volume rendering method, **we are more interested in $D_3(X)$, the distance from each voxel X to the nearest colonic surface**. For each voxel inside the colon, this distance is calculated as an Euclidean distance map [16].

Based on such an observation, we propose a fast ray casting method by **exploiting the distance information from each voxel inside the colon to the closest colon wall**. Specifically, when we start ray traversal from the viewpoint, instead of performing regular sampling in the short equal-distance intervals, **we first check the distance from the current sampling point to the nearest colon wall**.

(pg. 398, first two paragraphs under section 3.3, some text bolded for clarity)

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Novak and Wan. Wan teaches one advantage of the combination by teaching of:

Our method is a fast direct volume rendering technique that exploits distance information stored in the potential field of the camera control model
(abstract)

where Novak would benefit from such a fast interactive system.

As per claims 2, 9, and 11, Novak teaches the claimed "performing a segmentation" by teaching of "The result of the automatic segmentation is shown in a separate window" (paragraph [0044]). It would have been obvious to one of ordinary skill in the art at the time of invention to combine Novak and Wan for the same reasons as stated in claims 1, 8, and 10.

As per claim 3, Novak teaches the claimed "distance ... determined along a direction of projection" by teaching of "maximum intensity projection view" (paragraph [0013]) and by teaching of "A volume of interest may be selected by moving the positioning device such as a mouse" (paragraph [0040]).

Novak does not explicit teaches of directly associating the mouse movement selection (entering a user selected distance) with this projection view.

However, it would have been obvious to associate a distance with this mouse movement and with this projection view. By selecting distance using the mouse in the projection view, the user may have a better sense of distance and depth due to the projection of the view itself. Further, Novak teaches that the projection view of its system contains maximum intensity where it may be easier to make a proper selection (paragraph [0013]).

As per claims 4 and 5, Novak does not explicitly teach the claimed "distance ... determined by a minimum distance measure" and the claimed "distance measure being an Euclidean distance".

Wan teaches the claimed limitations by teaching of:

For each voxel inside the colon, this distance is calculated as an **Euclidean distance map** [16]. For the remaining voxels beyond or on the colon wall, the distance value is set to 0. The basic idea of our rendering method is described as follows (pg. 398, first paragraph under section 3.3)

where the inside voxels may include a second voxel and where a minimum distance can be achieved by measuring the distance to the surrounding walls. It would have been obvious to one of ordinary skill in the art at the time of invention to combine Novak and Wan for the same reasons as stated in claims 1, 8, and 10.

As per claims 6, 14, and 16, Novak teaches the claimed "the volumetric data is medical image data" by teaching of "digital volumetric medical image of at least one lung" (paragraph [0011]). It would have been obvious to one of ordinary skill in the art at the time of invention to combine Novak and Wan for the same reasons as stated in claims 1, 8, and 10.

As per claim 7, Novak does not explicitly teach the claimed "the volumetric data being three dimensional microscopy data". Wan teaches the claimed limitations by teaching of "colonoscopy" (first paragraph under section 3.1). It would have been

Art Unit: 2628

obvious to one of ordinary skill in the art at the time of invention to combine Novak and Wan for the same reasons as stated in claims 1, 8, and 10.

As per claim 12, Novak teaches the claimed "volume rendering of the second voxels" by teaching of "shown in a separate window ... as a shaded surface display or a volume rendering" (paragraph [0044]). It would have been obvious to one of ordinary skill in the art at the time of invention to combine Novak and Wan for the same reasons as stated in claims 1, 8, and 10.

As per claims 13, 15, and 17, Novak teaches the claimed limitations by teaching of "digital volumetric medical image of at least one lung" (paragraph [0011]). It would have been obvious to one of ordinary skill in the art at the time of invention to combine Novak and Wan for the same reasons as stated in claims 1, 8, and 10.

Response to Arguments

2. Applicant's arguments filed have been fully considered but they are not persuasive. Applicant's arguments are based upon arguing limitations of the claims that were amended and added after the issue of the previous office action.

Conclusion

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel F. Hajnik whose telephone number is (571) 272-7642. The examiner can normally be reached on Mon-Fri (8:30A-5:00P).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka J. Chauhan can be reached on (571) 272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2628

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel Kaurin 6/11/06

DFH

Ulka Chauhan
ULKA CHAUHAN
SUPERVISORY PATENT EXAMINER